U.S. Department of Energy's Office of Science

Advanced Scientific Computing Research Program

COV Findings, Congressional Actions, and American Competitiveness Initiative

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R&D Programs – Major Findings

- COV evaluated three ASCR R&D Programs (Applied Mathematics, Computer Science, and Collaboratories Programs) in 2004
- In general the programs reviewed were effective and reasonably well managed
- The Lab proposal process needed standardization
- A more formal review process for Lab proposals was recommended
- More standardized documentation was desired for Lab project selection decisions
- Document management needs improvement

Improvements

- **Lab Proposal Processing Standardization**:
  - Conducted Workflow Analyses for Grant (see next slide) and Lab proposals
  - Implemented a more formal Lab proposal review process including:
    - Use of PeerNet for Lab proposal reviews
    - "Reviewable" Lab proposals
    - At least 3 Reviewers to each proposal
  - Implemented a new Lab process in Applied Math Program since last August and Computer Science program is next
- **Documentation**
  - Office of Science updated the Selection Statement Form for grants that requires clear documentation of selection justification in 2005
  - The Applied Math Program is using the SC Selection Statement Form for both grants and Lab projects (Computer Science is next)
  - DocuShare is used as central documents repository

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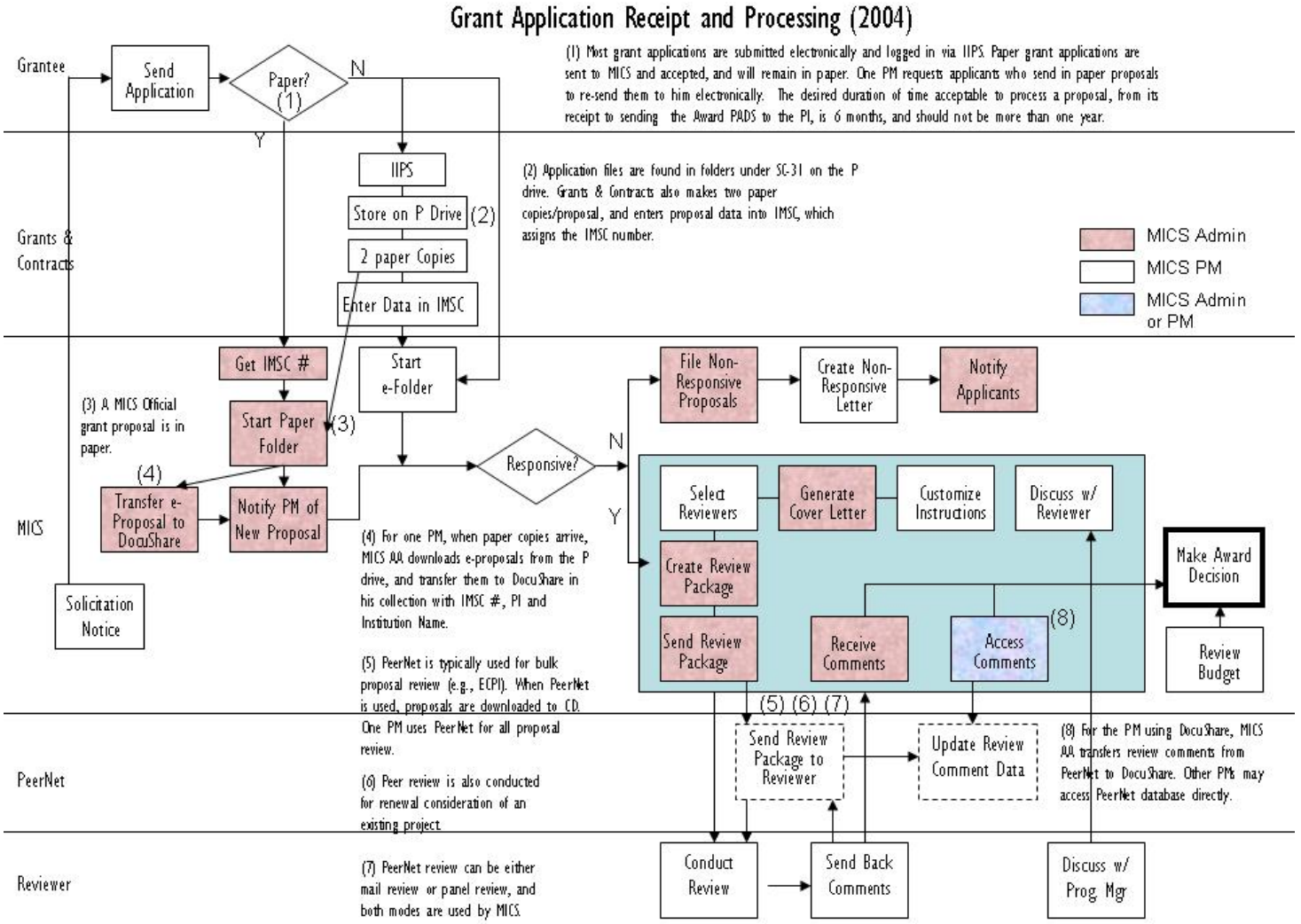
Grant Proposal Processing Analysis

Advanced Scientific Computing Research Program



Facilities & Network – Major Findings

- **COV evaluated the Facilities and Network Research Program in April 2005**
- **Deemed "the reviewed ASCR facilities and Networking Research Program to be highly effective and well managed"**
- **Found "ASCR management applies vision and judgment throughout the areas under review"**
- **In particular, "services to users provided by the ASCR facilities (NERSC and ESnet) are outstanding." --- COV 2005 Report**

Recommendation

- **Need Capacity and Capability Planning**

Department of Energy High-End Computing Revitalization Act of 2004

- **Became Public Law 108-423 on Nov. 30, 2004**
- **Requires the Secretary of Energy to carry out a program of research and development to advance high-end computing using Leadership Systems**
- **Scope includes establishment of at least 1 High-End Software Development Center**

Implementation of PL 108-423

- **Leadership Computing Facilities**
  - ORNL: Cray-based
  - ANL: IBM Blue Gene-based

- **High-End Software Development Center(s) will be implemented as SciDAC Institute(s) to be selected by a competitive proposal process**

The Advanced Research Projects Agency - Energy (ARPA-E)

- **Bill was introduced in Dec 2005/Jan 2006**
- **To be established within the DOE**
- **Take on high-risk, high pay-off research to move advanced energy technologies into marketplace faster**
- **Goal: Reduce the amount of energy imports by 20% over the next 10 years**
- **Funding was proposed to begin at the $3B level in FY07 and end at the $9B level in FY12**

Potential Impact on ASCR

- **ASCR could be a major resource by providing:**
  - World-class HPC capability
  - New, multi-scale, multi-disciplinary solutions
  - Cutting-edge simulation & modeling capability
  - Cutting-edge data management and analysis capability and distributed environment

American Competitiveness Initiative (ACI)

- **Introduced by President Bush in the State of the Union Address on Feb 2, 2006**
- **Encourage American innovation and strengthen America's ability to compete in the global economy**
- **Will double the Federal commitment to the most critical basic research programs in physical sciences and engineering over the next 10 years**

Potential Impact on ASCR

- **Continued support on ASCR's efforts on**:
  - Leadership Computing Facilities;
  - Large-scale, multiscale data processing, analysis, and visualization;
  - Simulation and modeling,
  - All of the above supporting innovative science applications.